

What is claimed is:

1. A BCSG comprising:

(a) a polynucleotide of SEQ ID NO:1, 2, 3, 4, 5, 18 or 20 or a variant thereof;

(b) a protein expressed by a polynucleotide of SEQ ID NO:1, 2, 3, 4, 5, 18 or 20 or a variant thereof; or

(c) a polynucleotide which is capable of hybridizing under stringent conditions to the antisense sequence of SEQ ID NO: 1, 2, 3, 4, 5, 18 or 20.

2. The BCSG of claim 1 comprising a protein of SEQ ID NO:19 or 21.

3. A method for diagnosing the presence of breast cancer in a patient comprising:

(a) determining levels of BCSG in cells, tissues or bodily fluids in a patient; and

(b) comparing the determined levels of BCSG with levels of BCSG in cells, tissues or bodily fluids from a normal human control, wherein a change in determined levels of BCSG in said patient versus normal human control is associated with the presence of breast cancer.

4. A method of diagnosing metastases of breast cancer in a patient comprising:

(a) identifying a patient having breast cancer that is not known to have metastasized;

(b) determining BCSG levels in cells, tissues, or bodily fluid from said patient; and

(c) comparing the determined BCSG levels with levels of BCSG in cells, tissue, or bodily fluid of a normal human control, wherein an increase in determined BCSG levels in the patient versus the normal human control is associated with breast cancer which has metastasized.

5. A method of staging breast cancer in a patient having breast cancer comprising:

- (a) identifying a patient having breast cancer;
- (b) determining BCSG levels in a sample of cells, 5 tissue, or bodily fluid from said patient; and
- (c) comparing determined BCSG levels with levels of BCSG in cells, tissues, or bodily fluid of a normal human control, wherein an increase in determined BCSG levels in said patient versus the normal human control is associated 10 with breast cancer which is progressing and a decrease in the determined BCSG levels is associated with breast cancer which is regressing or in remission.

6. A method of monitoring breast cancer in a patient for the onset of metastasis comprising:

- 15 (a) identifying a patient having breast cancer that is not known to have metastasized;
- (b) periodically determining levels of BCSG in samples of cells, tissues, or bodily fluid from said patient; and
- (c) comparing the periodically determined BCSG levels 20 with levels of BCSG in cells, tissues, or bodily fluid of a normal human control, wherein an increase in any one of the periodically determined BCSG levels in the patient versus the normal human control is associated with breast cancer which has metastasized.

25 7. A method of monitoring a change in stage of breast cancer in a patient comprising:

- (a) identifying a patient having breast cancer;
- (b) periodically determining levels of BCSG in cells, tissues, or bodily fluid from said patient; and
- 30 (c) comparing the periodically determined BCSG levels with levels of BCSG in cells, tissues, or bodily fluid of a normal human control, wherein an increase in any one of the periodically determined BCSG levels in the patient versus

the normal human control is associated with breast cancer which is progressing in stage and a decrease is associated with breast cancer which is regressing in stage or in remission.

5 8. A method of identifying potential therapeutic agents for use in imaging and treating breast cancer comprising screening molecules for an ability to bind to BCSG wherein the ability of a molecule to bind to BCSG is indicative of the molecule being useful in imaging and
10 treating breast cancer.

9. An antibody which specifically binds BCSG.

10. The antibody of claim 9 wherein the BCSG comprises SEQ ID NO: 1, 2, 3, 4, 5, 18, 19, 20 or 21.

15 11. A method of imaging breast cancer in a patient comprising administering to the patient the antibody of claim 9.

12. The method of claim 11 wherein said antibody is labeled with paramagnetic ions or a radioisotope.

20 13. A method of treating breast cancer in a patient comprising administering to the patient the antibody of claim 9.

14. The method of claim 13 wherein the antibody is conjugated to a cytotoxic agent.

Sub
A3 15. A method of treating breast cancer in a patient comprising administering to the patient a molecule which downregulates expression or activity of a BCSG.

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16. A method of inducing an immune response against a target cell expressing a BCSG comprising delivering to a human patient an immunogenically stimulatory amount of a BCSG protein so that an immune response is mounted against the target cell.

17. ~~A vaccine for treating breast cancer comprising a~~
BCSG.

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